P- CHANNEL DYNAMIC FLASH MEMORY CELLS WITH ULTRATHIN TUNNEL OXIDES

Abstract of the Disclosure

Structures and methods involve dynamic enhancement mode p-channel flash memories with ultrathin tunnel oxide thicknesses. Both write and erase operations are performed by tunneling. The p-channel flash memory cell with thin tunnel oxides will operate on a dynamic basis. The stored data can be refreshed every few seconds as necessary. However, the write and erase operations will now be orders of magnitude faster than traditional p-channel flash memory. Structures and methods for p-channel floating gate transistors are provided that avoid p-channel threshold voltage shifts and achieve source side tunneling erase. The p-channel memory cell structure includes a floating gate separated from a channel region by an oxide layer of less than 50 Angstroms. The methods further include reading the p-channel memory cell by applying a potential to a control gate of the p-channel memory cell of less than 1.0 Volt.